incidence of PJP, suggesting that PJP prophylaxis is not routinely warranted in this patient population. Patients who require systemic corticosteroids post–HSC may be considered for PJ prophylaxis.

151

Long Term Outcomes of Autologous Hematopoietic Cell Transplant (AHCT) Following Thiotepa-Based High-Dose Therapy (HDT) in Patients with Non-Hodgkin Lymphoma (NHL)

Nilay A. Shah [1], Sherri Rauenzahn [2], Sijin Wen [3], Michael Craig [4], Abraham S. Kanate [5], Mehdi Hamadani [6], Aaron Cumpston [7].
[1] Internal Medicine, Section Hematology/Oncology, West Virginia University, Morgantown, WV; [2] Internal Medicine, West Virginia University, Morgantown, WV; [3] Biostatistics, West Virginia University, Morgantown, WV; [4] West Virginia University - Health Science Center, Morgantown, WV; [5] Section of Hematology/Oncology, Department of Medicine, West Virginia University, Morgantown, WV; [6] Hematology/Oncology, Medical College of Wisconsin, Milwaukee, WI; [7] Pharmacy, West Virginia University Hospitals, Morgantown, WV

There is little consensus regarding the optimal conditioning regimen for AHCT for NHL. Thiotepa is an alkylating agent with anti-lymphoma properties, but it has limited data as a conditioning agent for AHCT in adult NHL. We report here long-term results of our institutional experience in NHL receiving AHCT following HDT with etoposide, cyclophosphamide and thiotepa (VP-16/CY/TT). Patients received etoposide 1800mg/m2 IV x 1 dose, cyclophosphamide (50mg/kg/dose IV x 3-4 doses), and thiotepa (250mg/m2/dose – 300mg/m2/dose x 3 doses). Forty-three patients were consented and enrolled from November 1997 to June 2009.

Table 1
Baseline Demographics

Characteristics	N=43
Median age, years (range)	55 (27-69)
Male gender, n (%)	22 (51%)
Diagnosis (%)	
Diffuse Large B-cell Lymphoma (DLBCL)	23 (54%)
Follicular Lymphoma	7 (16%)
Transformed follicular lymphoma	2 (5%)
Mantle Cell Lymphoma	4 (9%)
T-cell NHL	7 (16%)
Bone Marrow Involvement	10 (23%)
CNS Involvement	2 (5%)
Stage	
Early Stage (1&2)	14 (32%)
Advanced Stage (3&4)	27 (63%)
Missing	2 (5%)
IPI	
Low (0-1)	17 (40%)
Intermediate (2-3)	23 (54%)
High (4-5)	2 (5%)
Unknown	1 (2%)
Prior therapies, median (range)	2 (1-4)
Remission status before transplant	
Complete Remission 1	8 (19%)
Complete Remission 2	17 (40%)
Complete Remission 3	2 (5%)
Partial Remission	16 (37%)
Autologous stem cell source (%)	
Peripheral Blood	35 (81%)
Bone Marrow	4 (9%)
Both	4 (9%)
Karnofsky Performance Status, median (range)	90 (80-100)
Median CD34 cell dose infused (10^6 cells/kg recipient), (range)	5.3 (1.8-10.5)

Disease characteristics are described in Table 1. Peripheral blood stem cell mobilization utilized cyclophosphamide and filgrastim. All patients received antibacterial, antiviral (acyclovir), and antifungal (fluconazole) prophylaxis along with filgrastim support after stem cell infusion. Median follow up for surviving patients was 4.7 years (range 0.26 years to 15.85 years). Median time to neutrophil and platelet engraftment was 13 and 21 days, respectively. Significant regimen-related toxicities included mucositis (51%), neutropenic fever (72%), diarrhea (26%), and pneumonia (9%). No CNS failures were reported. Secondary malignancies occurred in 3 patients (7%) – two of which were soft tissue sarcomas and one MDS/AML. Progression free survival (PFS) and overall survival (OS) at 5 years was 53% (39% - 71%) and 73% (60% - 89%), respectively. Relapse rates at day +100 and 5 years were 9.4% (95% CI: 2.9% – 20.4%) and 40.1% (95% CI: 24.7% - 55.1%), respectively. Cumulative incidence of non-relapse mortality at day +100 and 5 years was 4.7% (95% CI: 0.8% - 14.0%) and 7% (95% CI: 1.8% - 17.4%), respectively. VP-16/Cy/TT is a well-tolerated conditioning regimen for patients with NHL, with promising long term progression-free and overall survival rates.

152

A Higher Number of CD34+ Cells Collected during Mobilization Is Independently Associated with Successful Engraftment in Autologous Stem Cell Transplant Patients

Amy Sharma [1], Ljiljiana Vasovic [2], Xiaonan Xue [3], Dan Wang [4], Ira Braunschweig [5], Stefan Klaus Barta [5]. [1] Hematology Oncology, North Shore University, Manhasset, NY; [2] Pathology, Montefiore Medical Center, Bronx, NY; [3] Albert-Einstein Cancer Center, Bronx, NY; [4] Albert Einstein, Bronx, NY; [5] Oncology, Montefiore Medical Center, Bronx, NY

We performed a retrospective analysis on patients who underwent PBSC collection and subsequent ASCT at our institution to assess whether efficiency of PBSC mobilization is predictive of engraftment failure.
Methods: We identified 369 patients who underwent PBSC collection between 01/01/2006-8/31/2012 for a first ASCT. We collected data on age, sex, use of lenalidomide or thalidomide ("Imid") prior to mobilization, mobilization regimen, # of collections for final cell dose, # of CD34+ cells infused, and the presence of a positive blood culture within 30 days of ASCT. Quintiles were created for the # of CD34+ cells collected. The primary outcome was engraftment failure defined as not achieving an absolute neutrophil count (ANC) >1000/mL or a platelet count >50,000/mL (no platelet transfusion in </= 7 days) by day 30 post-ASCT. Secondary outcomes were time to ANC and platelet engraftment. We performed a multivariate logistic regression analysis to assess the association of collected CD34+ cells and engraftment failure while adjusting for the other variables. For time to event analyses we used Cox proportional hazard models.
Results: Median patient age was 58 and 56% were male. Patient-reported race was: Black (38%), White (17%), and "Other" (45%). Indications for ASCT were Multiple Myeloma (45%), Non-Hodgkin Lymphoma (41%), Acute Leukemia (9%), Hodgkin Lymphoma (3%), Amyloidosis (1%), and Germ Cell Tumors (1%). The median # of CD34+ cells collected was 7.7x10 ^6/kg (range 2.26-120 x10 ^6/kg) and median # of CD34+ cells infused was 5.3x10 ^6/kg (2.3-45x10 ^6/kg). Median # of collections for transplant dose was 2 (range 1-8). CD34 cells collected were divided into quintiles (cut points: 6.04, 7.57, 9.86 and 17.7x10 ^6/kg). We found that a higher # of collected CD34+ cells during mobilization was associated with less engraftment failure (p=.0067): every increase in

quintile was associated with a 40% decrease in the risk of engraftment failure (OR 0.60, 95% CI 0.41-0.87). Even when adjusted for cell dose infused, a higher # of collected CD34+ cells was associated with decreased time to platelet engraftment (HR1.15, CI 1.00-1.32, p=.052), but not ANC engraftment (HR 1.07, p=.35). Positive blood cultures within 30 days of ASCT were associated with engraftment failure (p=.0035), while race, sex, # of collections for the transplanted dose and mobilization regimen did not appear to affect engraftment. We also observed that prior Imid use demonstrated a trend toward less engraftment failure (OR 0.41, 95%CI 0.17-1.01; p=.052).

Although a moderate correlation was observed between the variables CD34 cells collected and CD34 cells infused, a sensitivity analysis by omitting either variable did not identify a significantly different estimates.

153

A Plerixafor-Based Strategy Allows Adequate Hematopoietic Stem Cell Collection in Poor Mobilizers: Results from the Canadian Special Access Program

Dawn Sheppard [1], Christopher N. Bredeson [2], Lothar Huebsch [3], David S. Allan [4], Jason Tay [5]. [1] The Ottawa Hospital, Ottawa, ON, Canada; [2] The Ottawa Hospital Blood & Marrow Transplant Program, Ottawa, ON, Canada; [3] Hematology, Ottawa Hospital, Ottawa, ON, Canada; [4] The Ottawa Hosp/Hem, Ottawa, ON, Canada; [5] The University of Ottawa, Ottawa, ON, Canada

Background: The collection of a minimum number of hematopoietic stem cells (HSC), generally defined as 2 x 10^6 CD34+ cells/kg, is a prerequisite for proceeding to HSCT. Primary mobilization failure occurs in 5 – 40% of patients.[1-5] When used to unselected patients undergoing a first mobilization attempt, plerixafor plus GCSF allows more CD34+ cells to be mobilization with fewer aphereses than GCSF alone.[6, 7] There are no publications describing the patterns of plerixafor use at Canadian transplant centres, nor is there data to guide determinations of cost-effectiveness of mobilization using plerixafor from the Canadian perspective.

Methods: The objectives of this study were to: 1) Summarize the published studies of plerixafor-based mobilization during compassionate access programs, and 2) Describe the Canadian experience with plerixafor during its availability though Health Canada's Special Access Program (SAP). A literature search was performed and studies were grouped into three strategies: upfront, preemptive and salvage. In Canada, plerixafor was available through the SAP, and funded by Genzyme/Sanofi from September 2008 to December 2010.

Results: Thirteen articles were identified. In all but one study, plerixafor was used as part of a preemptive and/or salvage strategy. The proportion lf patients in whom a minimum of 2 x 10^6 CD34+ cells/kg was collected ranged from 37 – 100%. At the time of publication, 17 – 87% of patients had proceeded to transplantation.

Thirteen Canadian centres provided data on a total of 132 patients, the majority of whom had multiple myeloma or lymphoma, and had undergone a median of 1 prior mobilization attempt (range 0 – 3). Plerixafor was used preemptively in 23 (17%) patients and as salvage in 109 (83%) patients. In 96 (73%) patients, there was successful collection. Of the 23 patients in whom plerixafor was used preemptively, 19 (83%) had successful collections. Of the 109 patients in whom the drug was used as part of a salvage strategy, 77 (71%) had successful collections. Of the entire cohort, 99 (75%) of patients went on to receive an autologous transplant.

Discussion: Our study summarizes the published experience with plerixafor-based mobilization during compassionate drug access programs and describes the Canadian experience when plerixafor was freely available through Health Canada's SAP. Canadian practice was similar to published international experience.

Plerixafor use decreased significantly when it was no longer freely available. This may be a reflection of limited resources, a lack of belief in the preemptive use of plerixafor or knowledge of the most cost-effective way to use it. The pharmacoeconomics of mobilization likely vary from centre to centre and are affected by multiple factors such as the patient population, infrastructure, available resources, and who is paying for plerixafor.

154

Target Value-Tailored Apheresis Can Improve Prediction of Product Hematopoietic Progenitor Cells Prior to Autologous Transplantation

Dawn Sheppard [1], Jason Tay [2], Lothar Huebsch [3], Sheryl Ann McDiarmid [4], Lisa Gilliard Martin [5], Doug Palmer [5], Paul Birch [5], Anargyros Xenocostas [6], Linda Hamelin [7], Christopher N. Bredeson [8]. [1] The Ottawa Hospital, Ottawa, ON, Canada; [2] The University of Ottawa, Ottawa, ON, Canada; [3] Hematology, Ottawa Hospital, Ottawa, ON, Canada; [4] BMT Program, Ottawa General Hospital, Ottawa, Ontario, Canada; [5] Canadian Blood Services, Ottawa, ON, Canada; [6] Division of Hematology, London Health Sciences Centre/ U Western Ontario, London, ON, Canada; [7] BMT, The Ottawa Hospital, Ottawa, ON, Canada; [8] The Ottawa Hospital Blood & Marrow Transplant Program, Ottawa, ON, Canada

Background: Collection of a minimum number of hematopoietic progenitor cells (HPC), usually defined as 2 x 10^6 CD34+ cells/kg, is required to ensure timely neutrophil and platelet recovery.[1-4] The majority of centres use peripheral blood-mobilized HPCs as the source of progenitor cells for autologous transplantation,[5] but the method used to predict the final apheresis product CD34+ cell content, and thus the whole blood volume to process during apheresis collection, has not been standardized. In the mid-1990s, Mitterer et al. demonstrated on a 28-patient cohort that the correlation between the pre-apheresis peripheral blood CD34+ cell count and the number of CD34+ cells/kg collected could be used to determine the blood volume to process during apheresis to harvest the desired number of CD34+ cells/kg (target-value tailored, TVT, collection). Using this concept and local data, the Ottawa Canadian Blood Services Stem Cell Laboratory created a similar regression model to help determine the blood volume to process during apheresis collection.

Methods: We conducted a retrospective study of all peripheral blood HPC apheresis collections performed at the Ottawa Hospital from January 1, 2003 to December 31, 2011. Our objective was to validate the TVT approach, as modified by our institution.

Results: From 2003 to 2011, there were 815 peripheral blood HPC collections by apheresis. The majority, 696 (85.4%), were autologous collections and 119 (14.6%) were allogeneic donors. The most common diagnoses were multiple myeloma and aggressive non-Hodgkin lymphoma (NHL). The median age of the cohort was 51.1 (range 14.3 – 70.4) years. The median number of prior chemotherapy regimens was 1 (range 0 – 5). The majority of collections, 635 (93.7%), were first attempts.

The median pre-collection peripheral blood CD34+ cell count was 2.23 (interquartile range, IQR 1.07 – 5)/μL. The